

Title (en)  
Semiconductor device having a heterojunction.

Title (de)  
Halbleiteranordnung mit einem Heteroübergang.

Title (fr)  
Dispositif semi-conducteur ayant une hétéro-jonction.

Publication  
**EP 0131111 A2 19850116 (EN)**

Application  
**EP 84105301 A 19840510**

Priority  
JP 8422383 A 19830516

Abstract (en)  
According to the present invention, a semiconductor device having first semiconductor layer (22) and a second semiconductor layer (23) smaller in a forbidden band gap than the first semiconductor layer (22), the first and second semiconductor layers being arranged so as to form a heterojunction, a first electrode (28) for controlling carriers (32) generated at least in the vicinity of the heterojunction interface, and at least two second electrodes (29, 30); is so constructed that the second semiconductor layer (23) exists between the first semiconductor layer (22) and the first electrode (28) for controlling the carriers (32), that both the first and second semiconductor layers (22, 23) contain an impurity at a concentration of only at most  $10^{15}$  cm<sup>-3</sup> and that an impurity (24) identical in a conductivity type to the carriers (32) is contained at a concentration of at least  $10^{16}$  cm<sup>-3</sup> in regions (25, 26) located between the second electrodes (29, 30) and a region where the carriers (32) are generated, so as to electrically connect the second electrodes (29, 30) and the carriers (32) generated in the vicinity of the heterojunction interface under the first electrode (28) for controlling the carriers. Elements of both the enhancement and depletion modes can be readily fabricated distinctively.

IPC 1-7  
**H01L 29/80**; **H01L 29/10**

IPC 8 full level  
**H01L 29/812** (2006.01); **H01L 21/331** (2006.01); **H01L 21/338** (2006.01); **H01L 27/06** (2006.01); **H01L 29/10** (2006.01); **H01L 29/73** (2006.01); **H01L 29/778** (2006.01); **H01L 29/80** (2006.01)

CPC (source: EP KR)  
**H01L 27/0605** (2013.01 - EP); **H01L 29/02** (2013.01 - KR); **H01L 29/1029** (2013.01 - EP); **H01L 29/7781** (2013.01 - EP); **H01L 29/7786** (2013.01 - EP); **H01L 29/80** (2013.01 - EP)

Cited by  
FR2582151A1; EP0246641A3; EP0201329A3

Designated contracting state (EPC)  
DE FR GB

DOCDB simple family (publication)  
**EP 0131111 A2 19850116**; **EP 0131111 A3 19851030**; **EP 0131111 B1 19900321**; CA 1208808 A 19860729; DE 3481747 D1 19900426; JP S59210672 A 19841129; KR 840009371 A 19841226; KR 910006698 B1 19910831

DOCDB simple family (application)  
**EP 84105301 A 19840510**; CA 454454 A 19840516; DE 3481747 T 19840510; JP 8422383 A 19830516; KR 840002624 A 19840515